

FIG.1

12 DOWNSAMPLING SECTION
13 FIRST LAYER CODING SECTION
14 FIRST LAYER DECODING SECTION
5 16 DOWNSAMPLING SECTION
17 DELAY SECTION
15 UPSAMPLING SECTION
19 SECOND LAYER CODING SECTION
20 SECOND LAYER DECODING SECTION
10 23 DELAY SECTION
22 UPSAMPLING SECTION
25 THIRD LAYER CODING SECTION
26 MULTIPLEXING SECTION

15 FIG.2

100 SPECTRUM CODING APPARATUS
103 FREQUENCY DOMAIN CONVERSION SECTION
104 BAND EXTENSION SECTION
105 EXTENDED SPECTRUM ASSIGNMENT SECTION
20 106 SPECTRAL INFORMATION SPECIFICATION SECTION
101 SAMPLING RATE CONVERSION SECTION
EXTENDED SPECTRUM

FIG.3A

25 INPUT SPECTRUM $S_1(k)$ ($0 \leq k < N_a$)

FIG.3B

EXTENDED INPUT SPECTRUM $S_1(k)$ ($0 \leq k < N_b$)

FIG. 4A

FREQUENCY [Hz]

5 FREQUENCY INDEX k

$0 \leq k < N_a$

FIG. 4B

FREQUENCY [Hz]

10 FREQUENCY INDEX k

$0 \leq k < N_b$

FIG. 5

130 RADIO TRANSMISSION APPARATUS

15 131 INPUT APPARATUS

132 A/D CONVERSION APPARATUS

120 CODING APPARATUS

133 RF MODULATION APPARATUS

20 FIG. 6

122 DOWNSAMPLING SECTION

123 FIRST LAYER CODING SECTION

124 FIRST LAYER DECODING SECTION

126 DELAY SECTION

25 100a SPECTRUM CODING SECTION

127 MULTIPLEXING SECTION

FIG.7

100a SPECTRUM CODING SECTION
103 FREQUENCY DOMAIN CONVERSION SECTION
104 BAND EXTENSION SECTION
5 105 EXTENDED SPECTRUM ASSIGNMENT SECTION
106 SPECTRAL INFORMATION SPECIFICATION SECTION
112 FREQUENCY DOMAIN CONVERSION SECTION

FIG.8

10 100b SPECTRUM CODING SECTION
103 FREQUENCY DOMAIN CONVERSION SECTION
104 BAND EXTENSION SECTION
105 EXTENDED SPECTRUM ASSIGNMENT SECTION
106 SPECTRAL INFORMATION SPECIFICATION SECTION
15 121 LPC ANALYSIS SECTION

FIG.9

180 RADIO RECEPTION APPARATUS
182 RF DEMODULATION APPARATUS
20 170 DECODING APPARATUS
184 OUTPUT APPARATUS
183 D/A CONVERSION APPARATUS

FIG.10

25 172 SEPARATION SECTION
173 FIRST LAYER DECODING SECTION
150 SPECTRUM DECODING SECTION

FIG.11

154 FREQUENCY DOMAIN CONVERSION SECTION
155 BAND EXTENSION SECTION
157 COMBINING SECTION
5 158 TIME DOMAIN CONVERSION SECTION
156 DECODING SECTION

FIG.12A

INPUT SPECTRUM $S_1(k)$ ($0 \leq k < N_a$)

10

FIG.12B

EXTENDED INPUT SPECTRUM $S_1(k)$ ($0 \leq k < N_b$)

FIG.13

15 FIRST SPECTRUM $S_1(k)$ WHOSE BAND IS EXTENDED
158 TIME DOMAIN CONVERSION SECTION
EXTENDED SPECTRUM $S_1(k)$

FIG.14A

20 140 WIRED TRANSMISSION APPARATUS
131 INPUT APPARATUS
132 A/D CONVERSION APPARATUS
120 CODING APPARATUS

25 FIG.14B

190 WIRED RECEPTION APPARATUS
191 RECEPTION APPARATUS

170 DECODING APPARATUS
184 OUTPUT APPARATUS
183 D/A CONVERSION APPARATUS

5 FIG.15
172 SEPARATION SECTION
173 FIRST LAYER DECODING SECTION
250 SPECTRUM DECODING SECTION

10 FIG.16
154 FREQUENCY DOMAIN CONVERSION SECTION
155 BAND EXTENSION SECTION
157 COMBINING SECTION
251 CORRECTION SECTION
15 158A TIME DOMAIN CONVERSION SECTION
156 DECODING SECTION

FIG.17
158a TIME DOMAIN CONVERSION SECTION

20
FIG.18
158a TIME DOMAIN CONVERSION SECTION
ASSIGNMENT OF ZERO VALUE

25 FIG.19
FIRST SPECTRUM $S_1(k)$

FIG.20A

BAND OF FIRST SPECTRUM

PROCESSING 1

PROCESSING 2

5 PROCESSING 1

TIME

FIG.20B

BAND OF FIRST SPECTRUM

10 PROCESSING 3

PROCESSING 4

PROCESSING 3

TIME

15 FIG.21

SIGNAL OF SAMPLING RATE F_y

301 HIERARCHICAL CODING SECTION

302 NETWORK CONTROL SECTION

OR

20 OR

303 HIERARCHICAL DECODING SECTION

DECODED SIGNAL

FIG.22

25 SIGNAL OF SAMPLING RATE F_y

401 HIERARCHICAL CODING SECTION

402-1 FIRST HIERARCHICAL DECODING SECTION

402-2 SECOND HIERARCHICAL DECODING SECTION
402-3 THIRD HIERARCHICAL DECODING SECTION
DECODED SIGNAL OF SAMPLING RATE F1
DECODED SIGNAL OF SAMPLING RATE F2
5 DECODED SIGNAL OF SAMPLING RATE F3

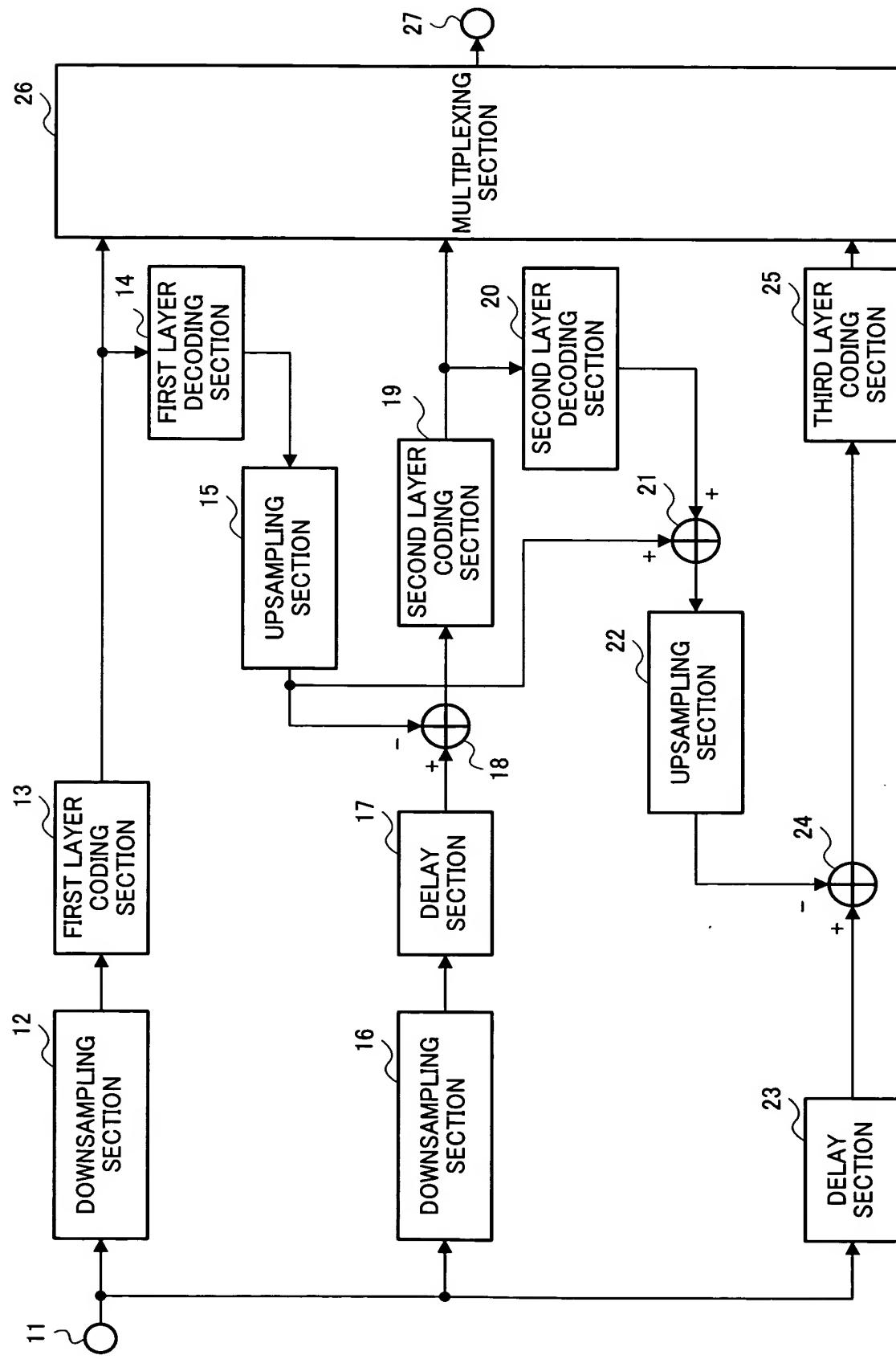


FIG. 1

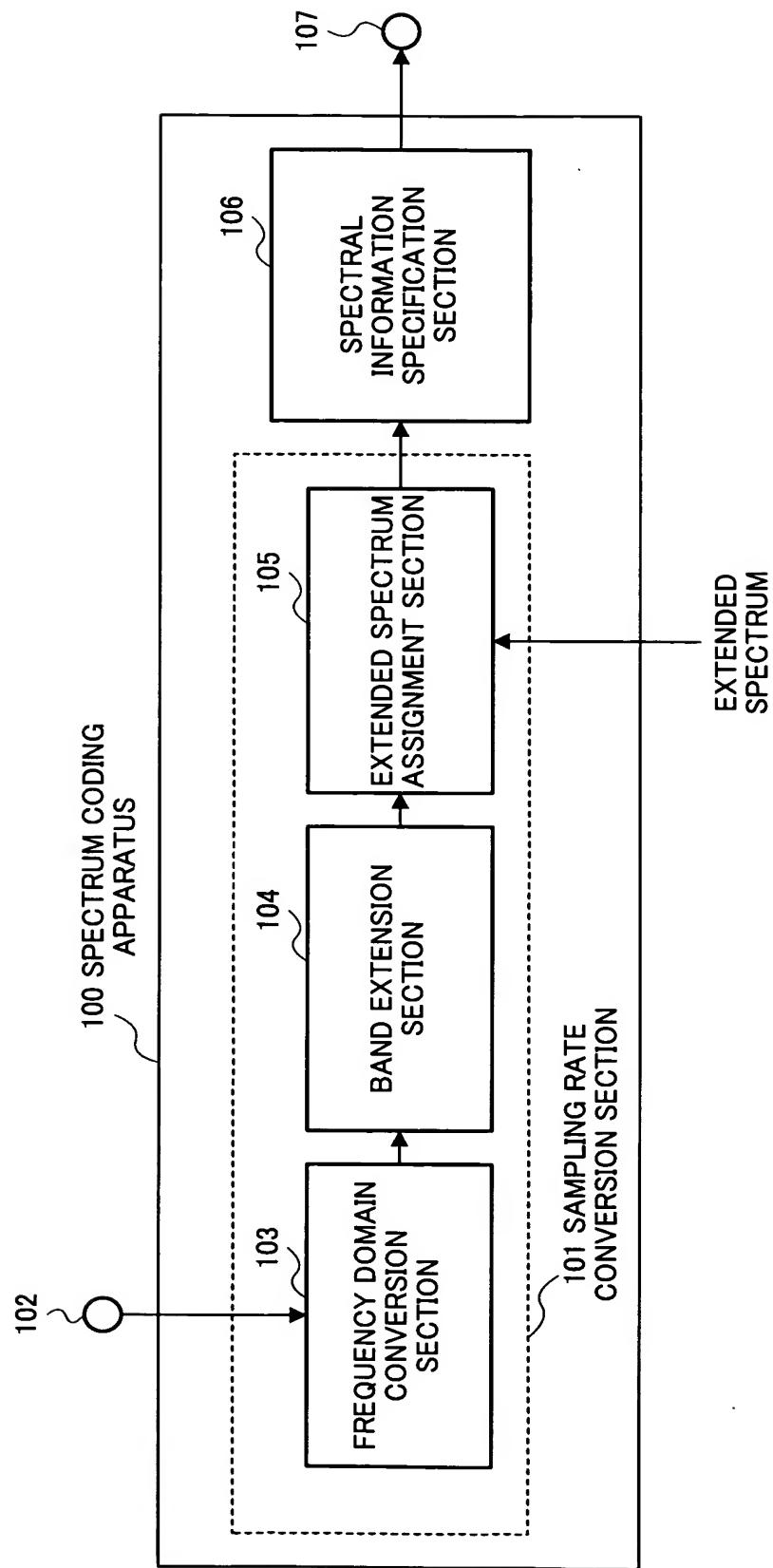
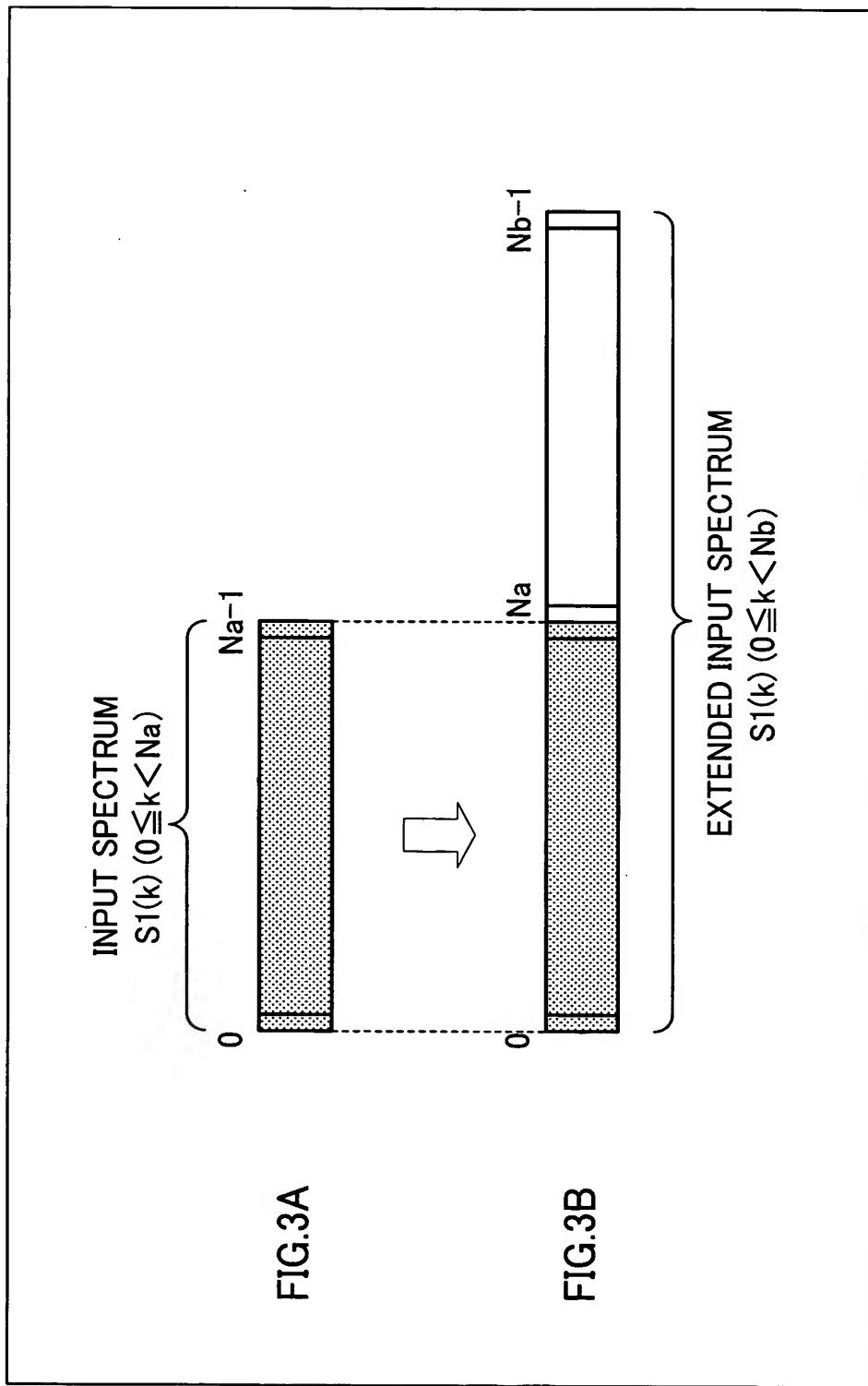


FIG.2



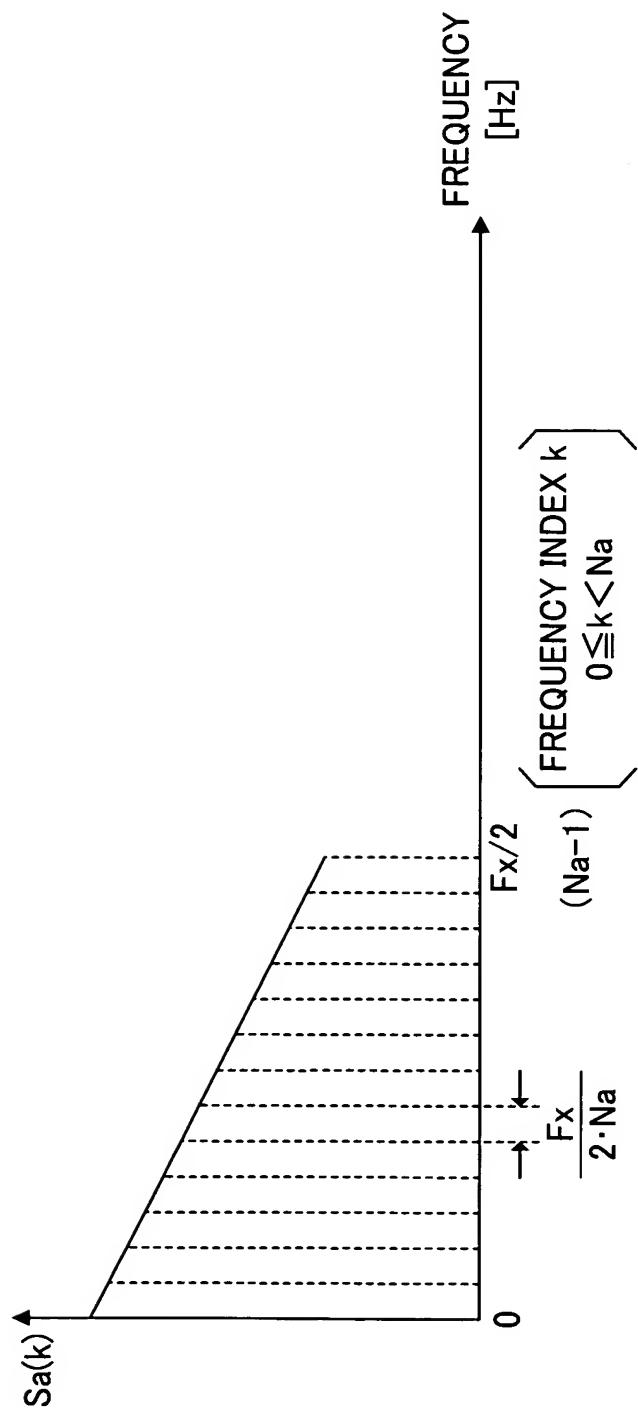


FIG.4A

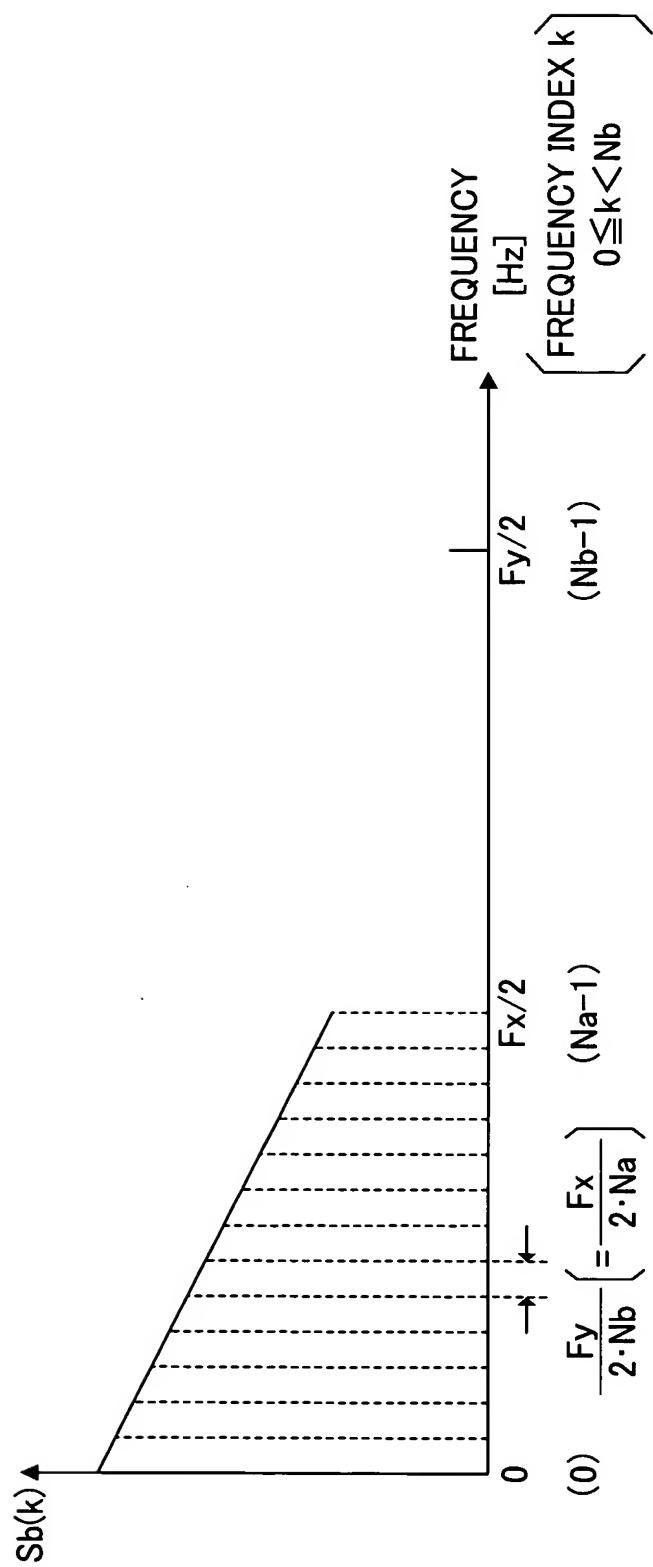


FIG.4B

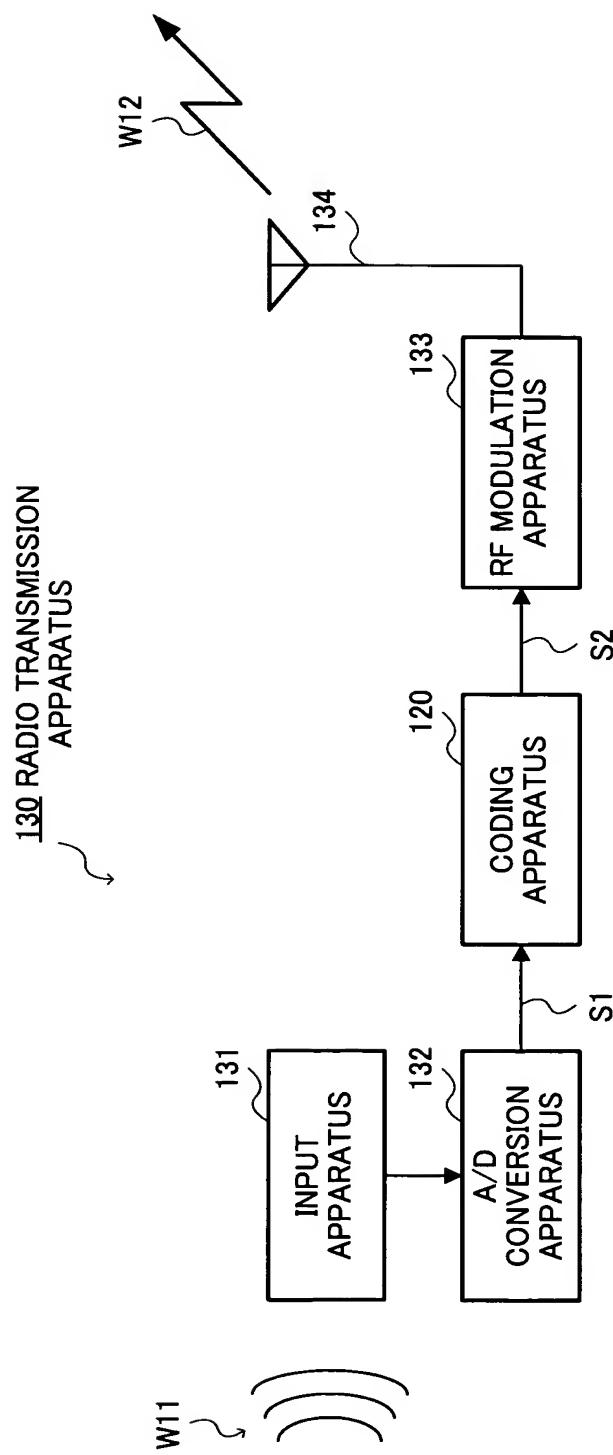


FIG.5

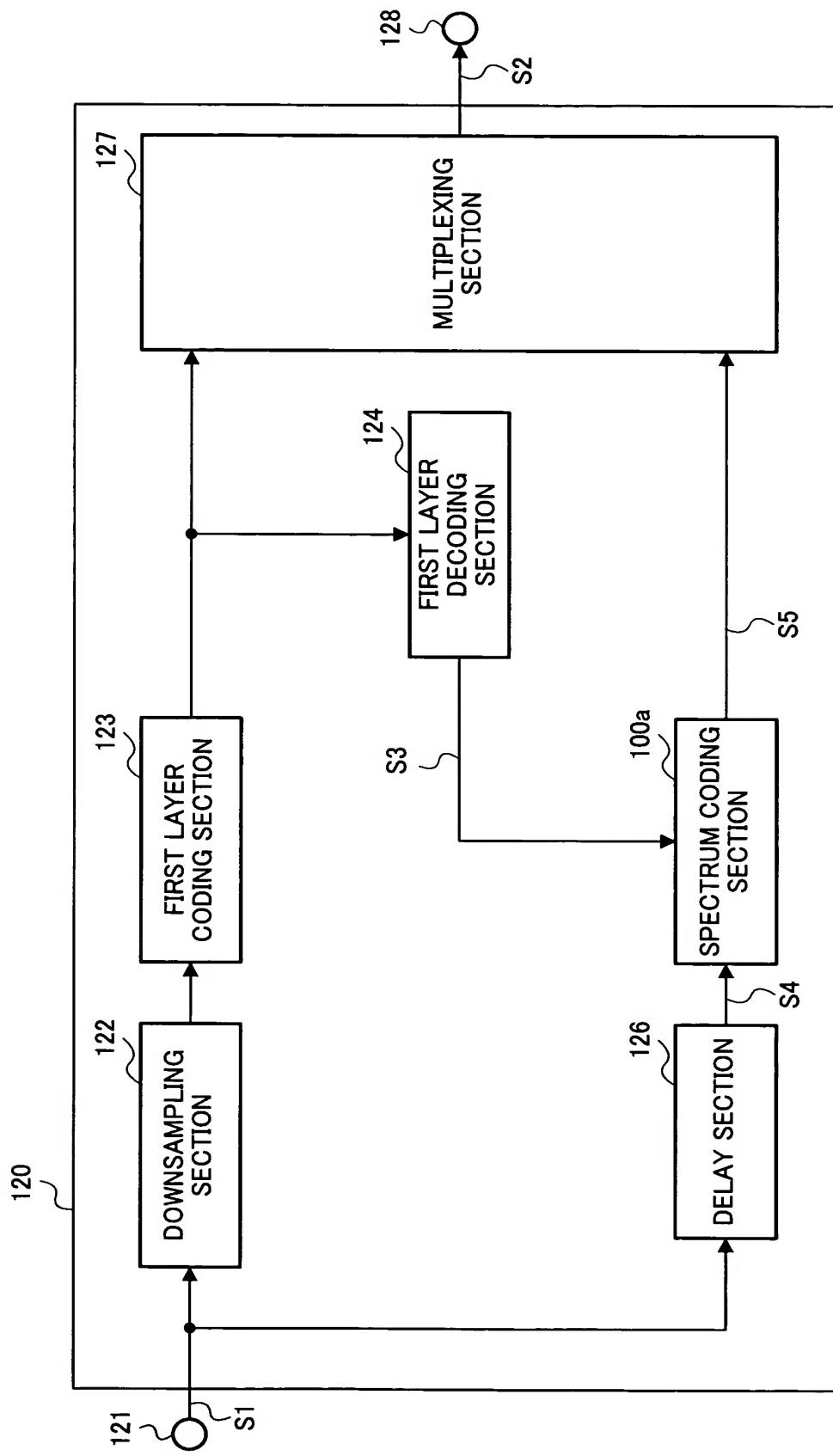


FIG.6

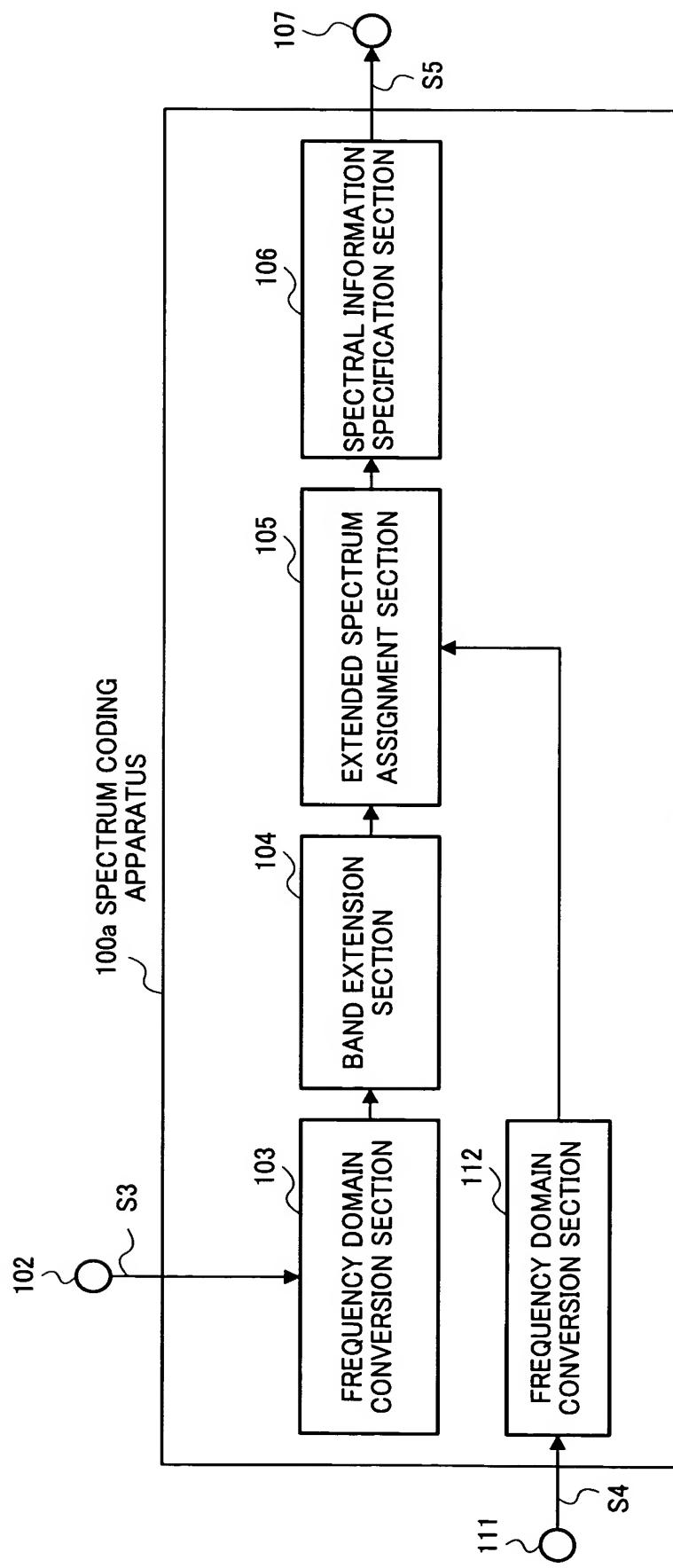


FIG.7

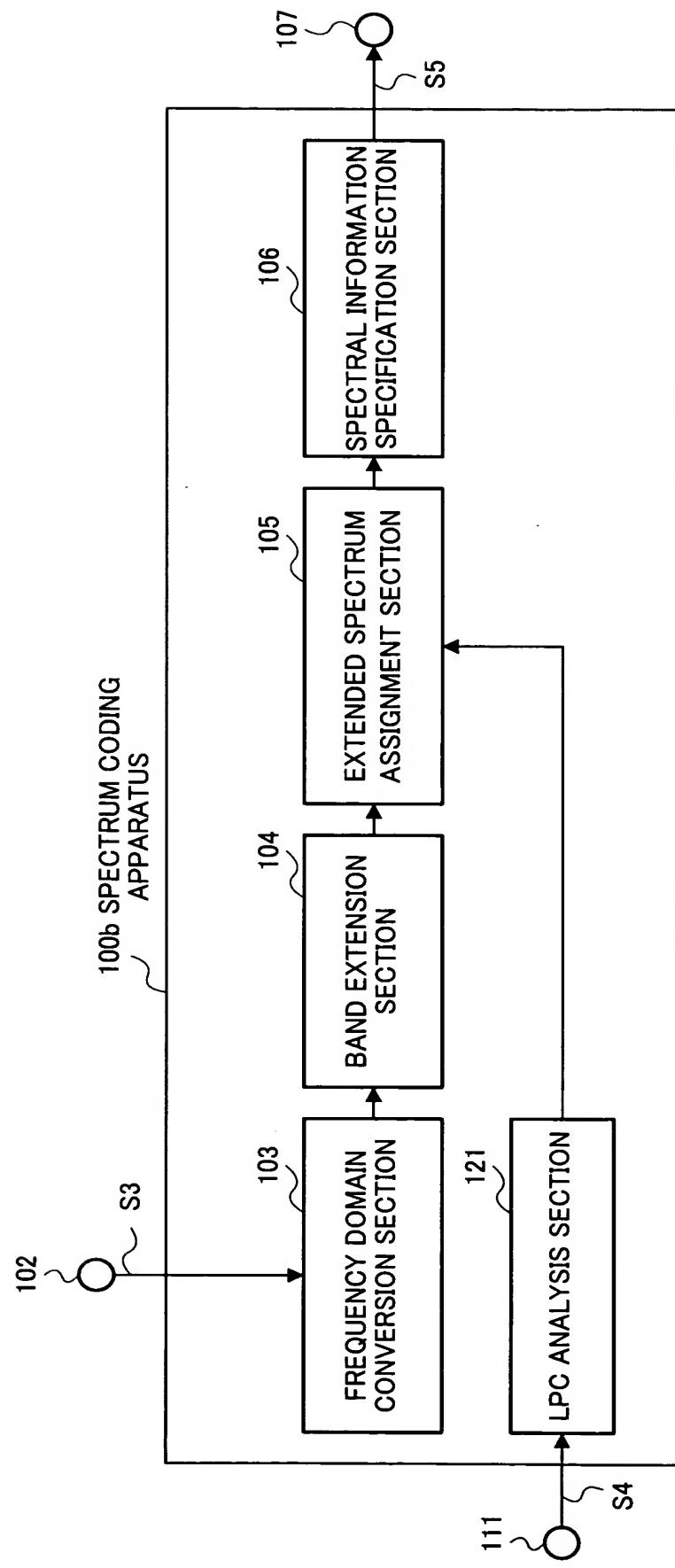


FIG.8

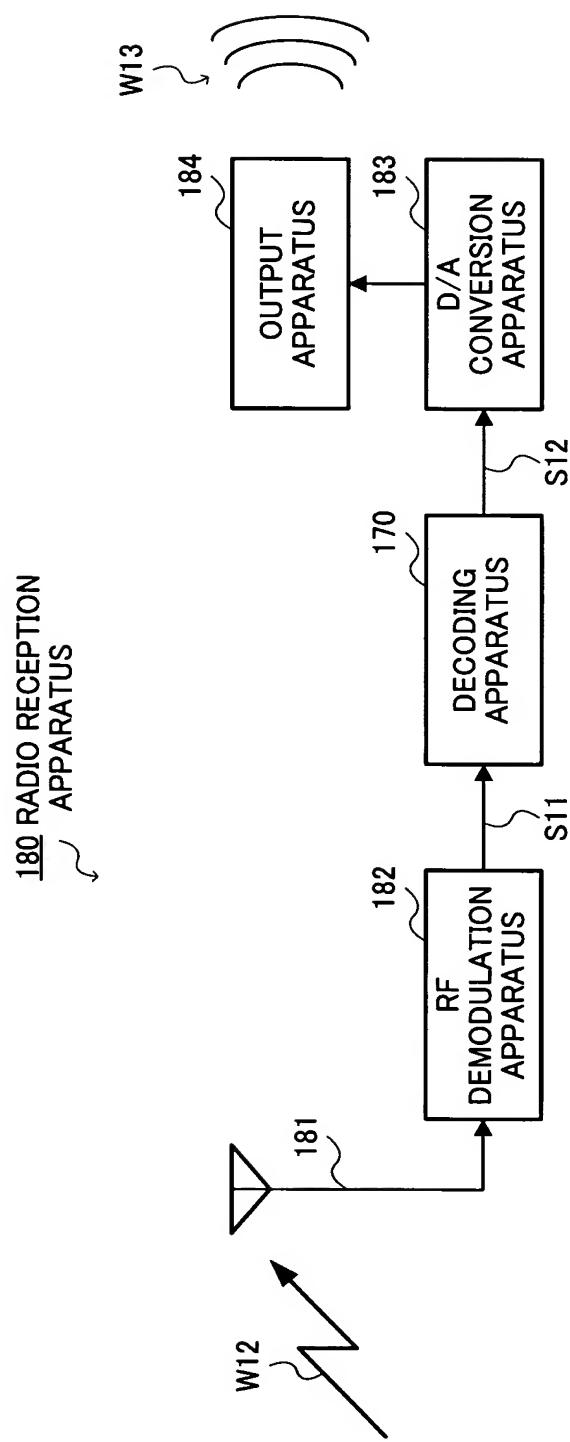


FIG.9

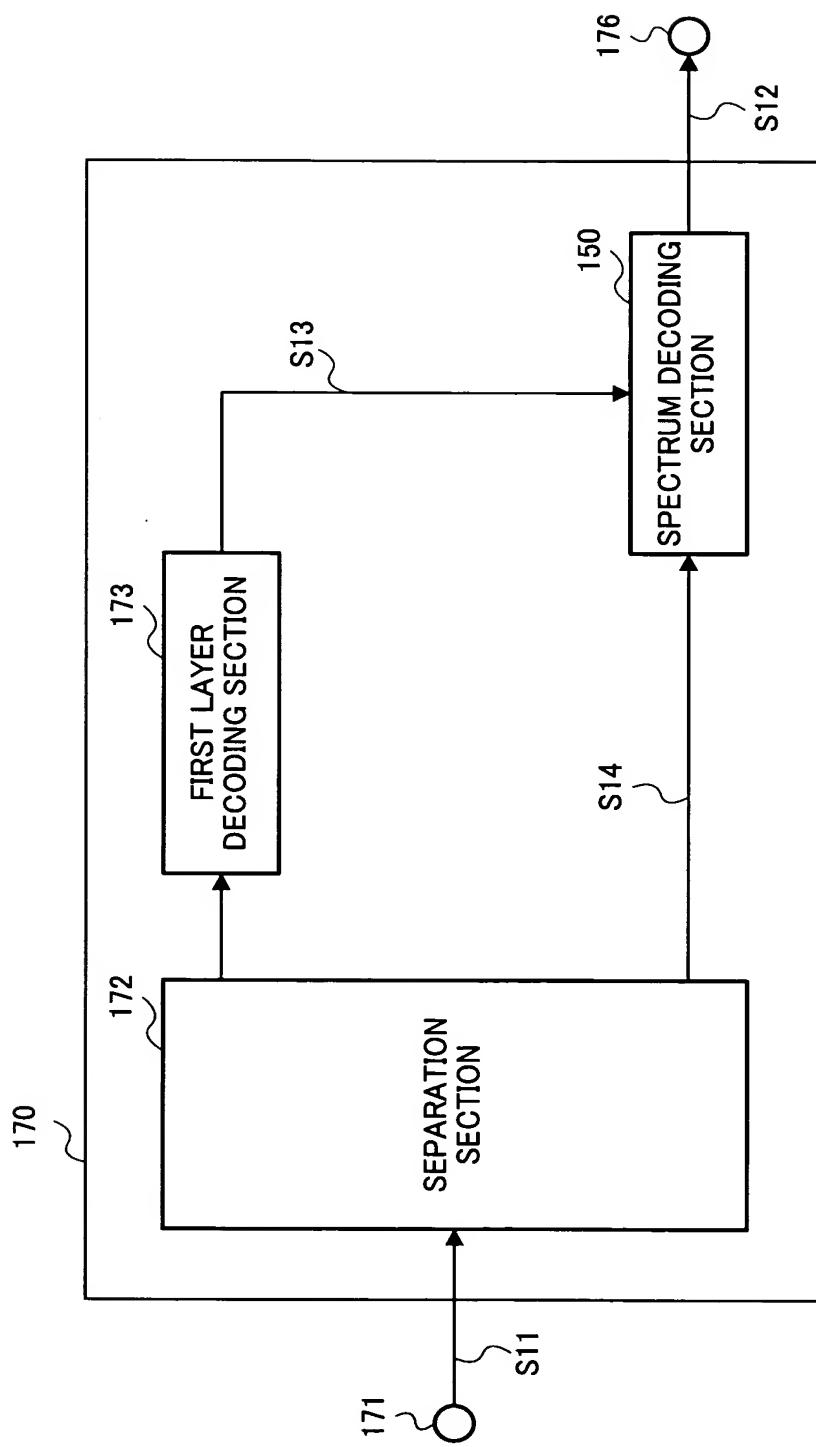


FIG.10

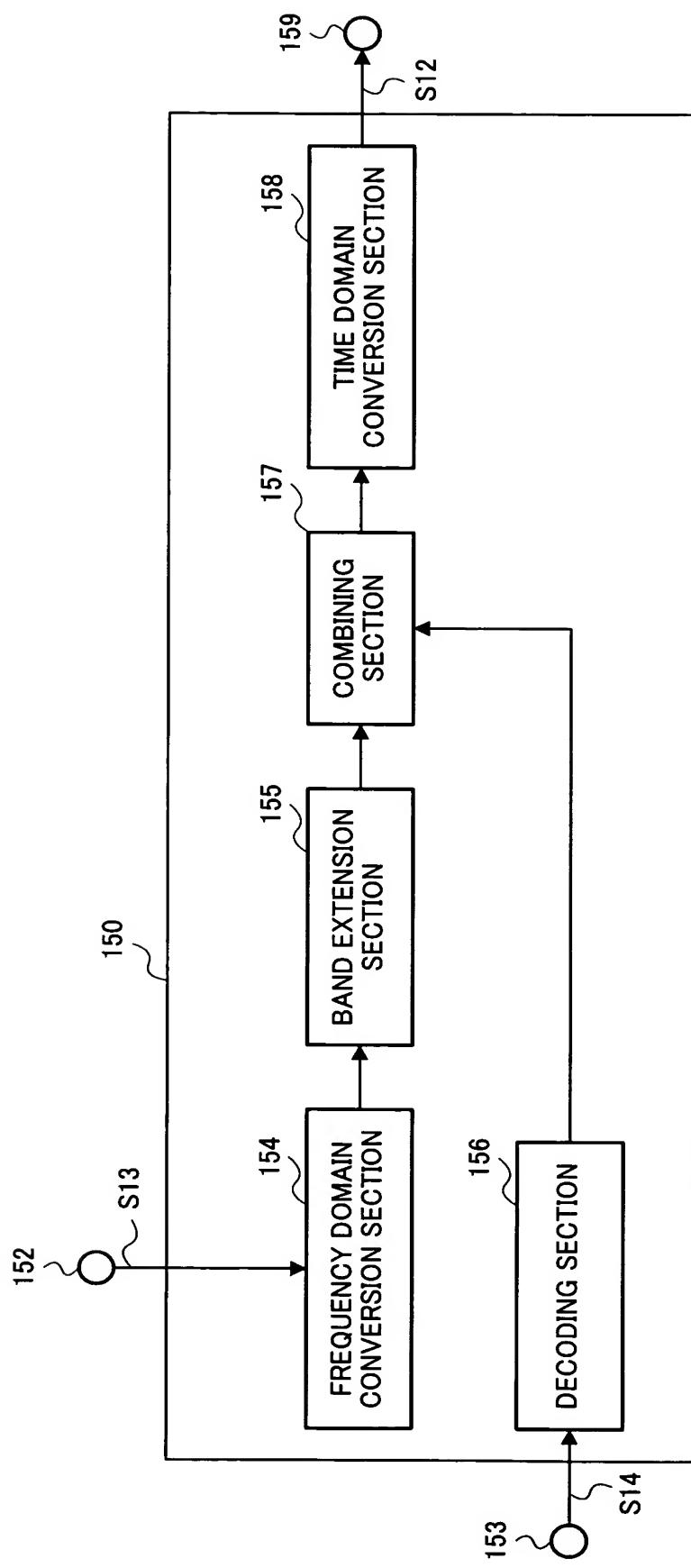
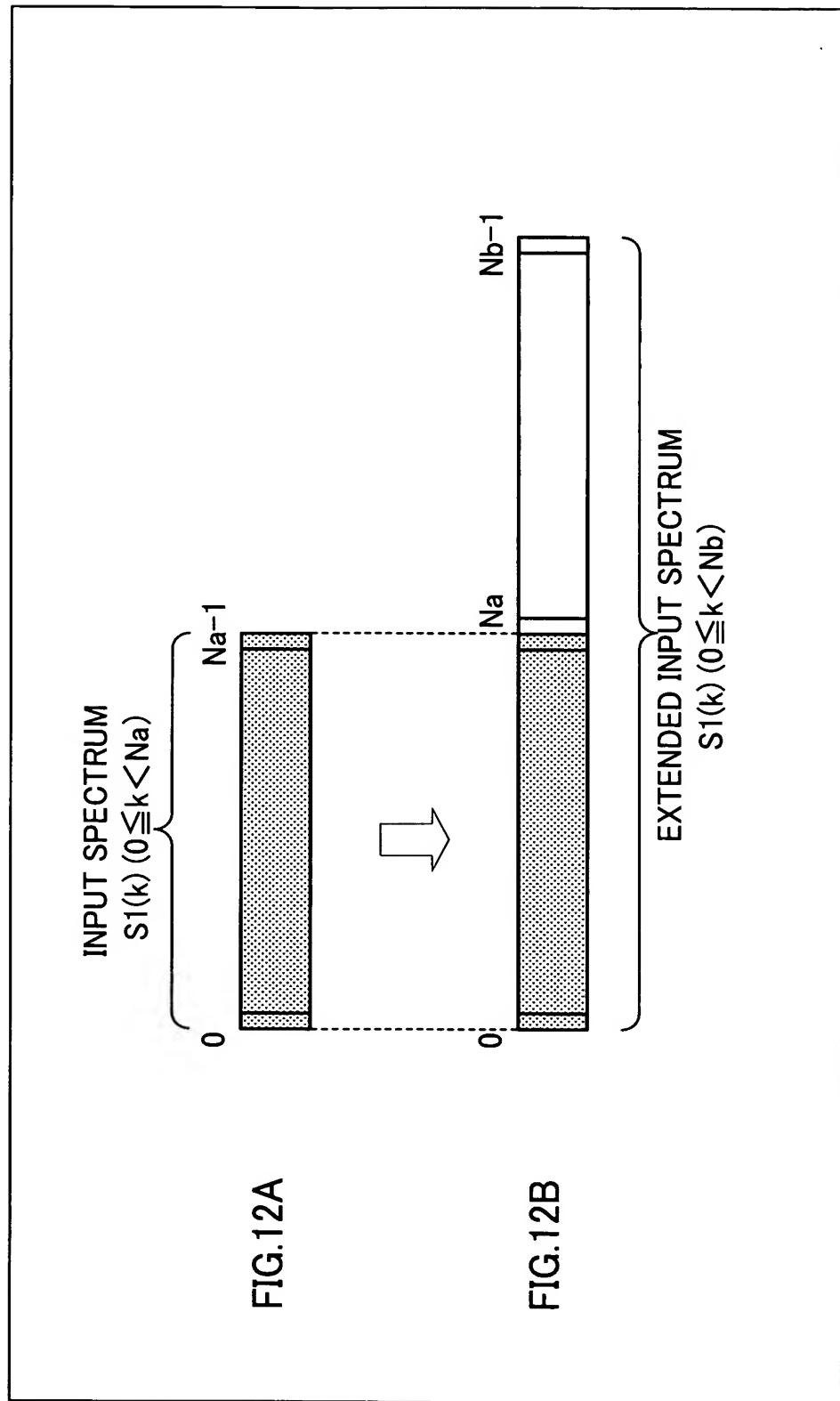


FIG.11



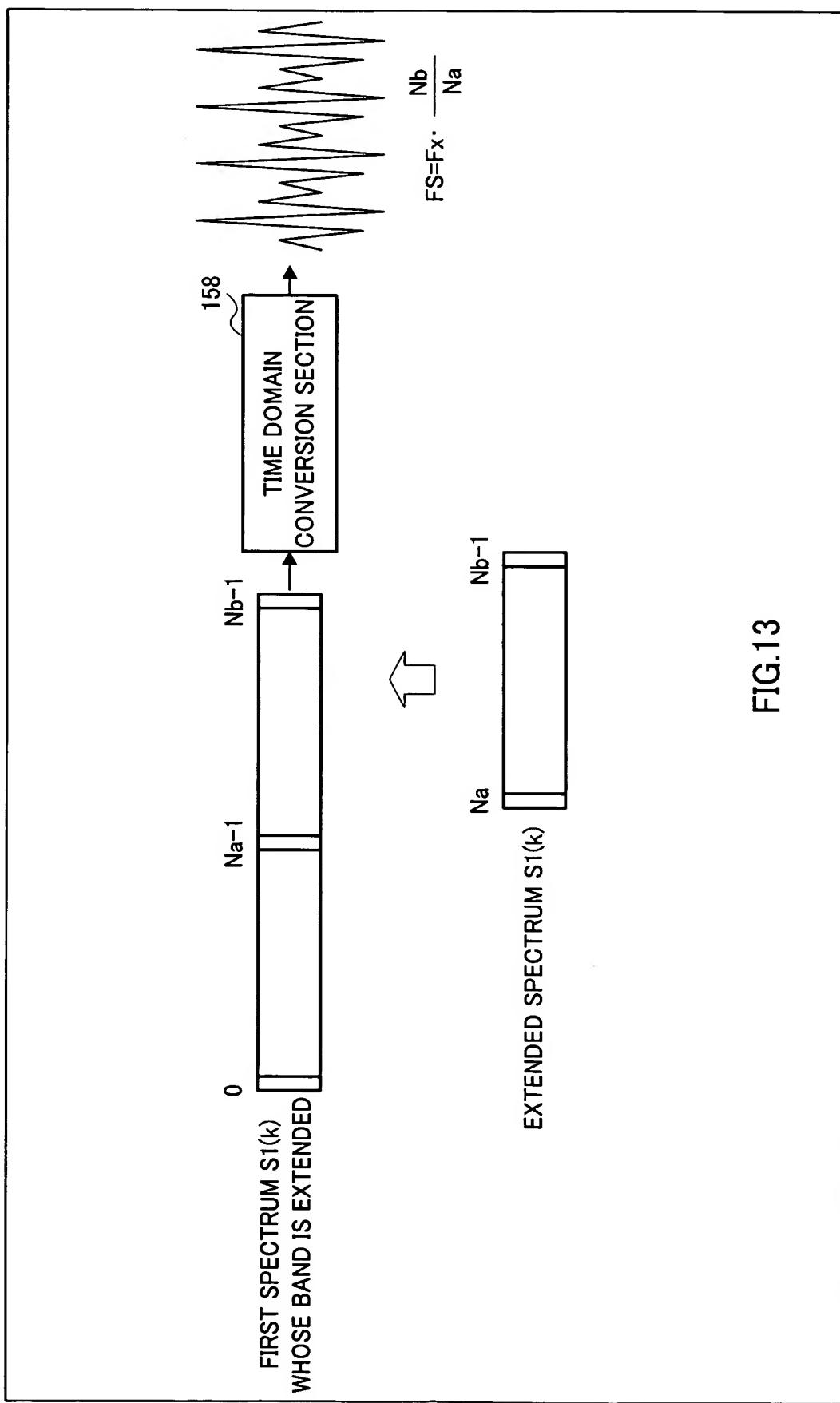


FIG.13

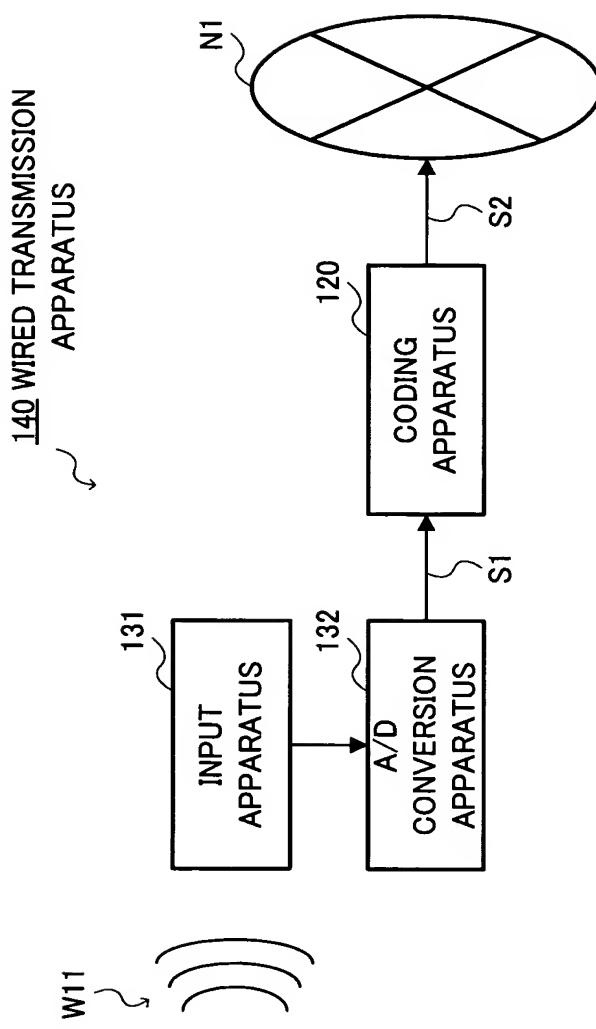


FIG.14A

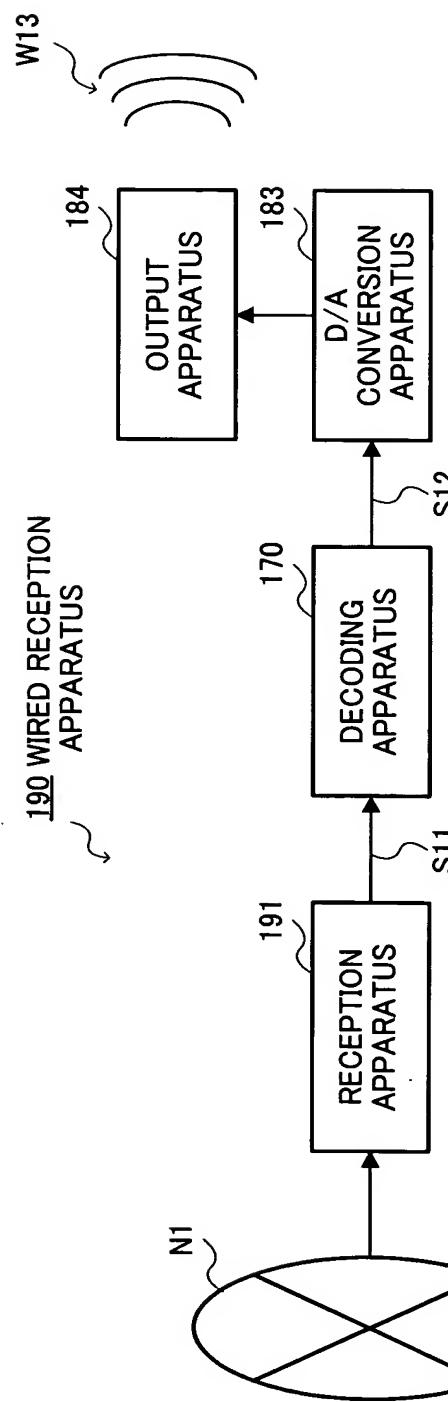


FIG. 14B

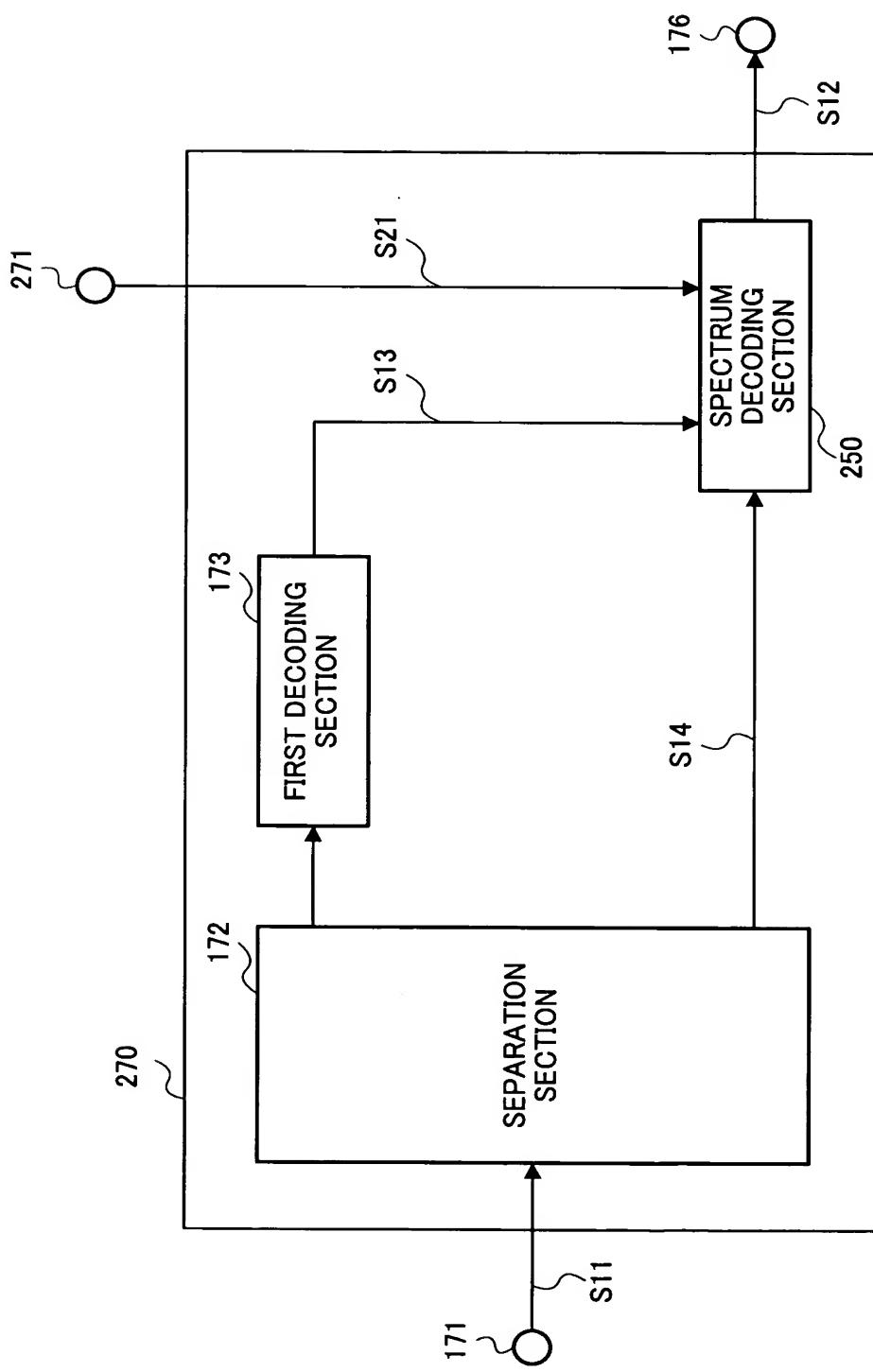


FIG.15

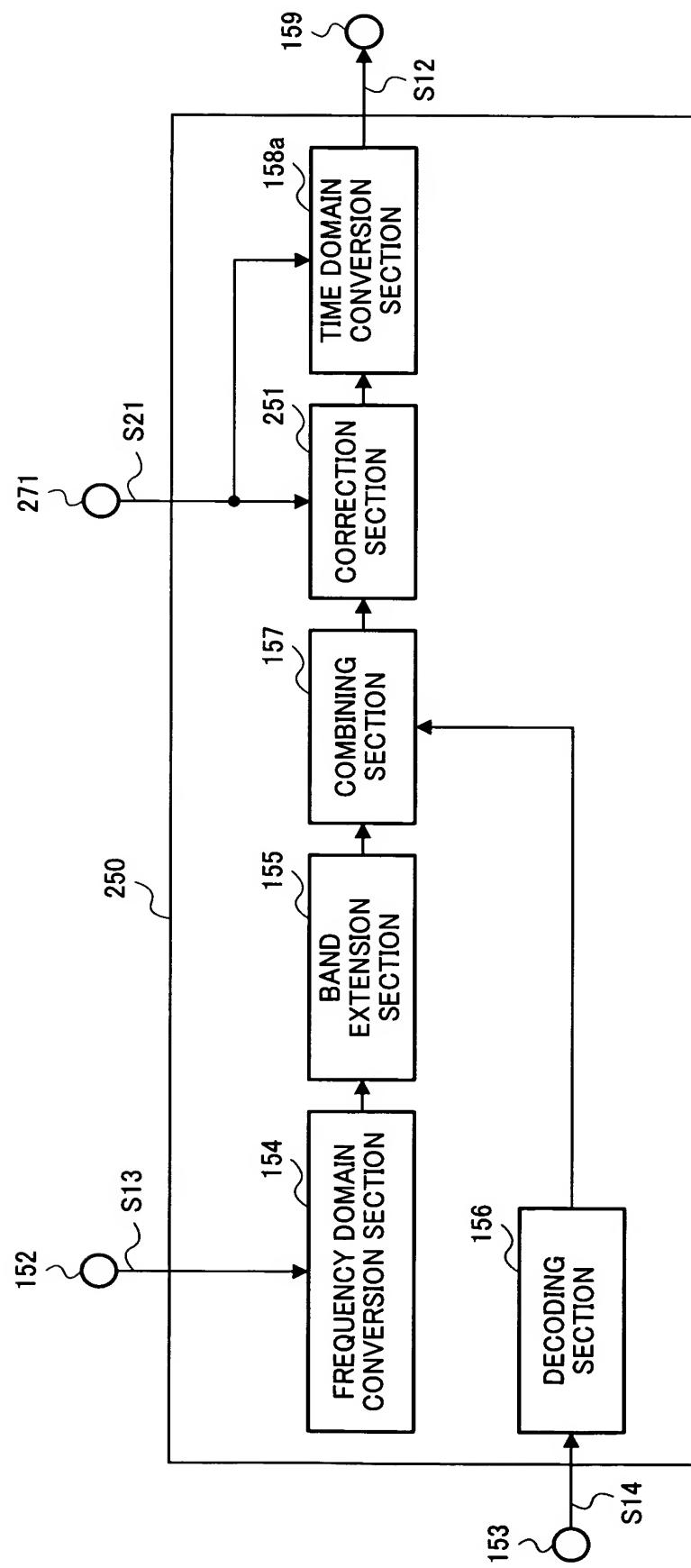


FIG.16

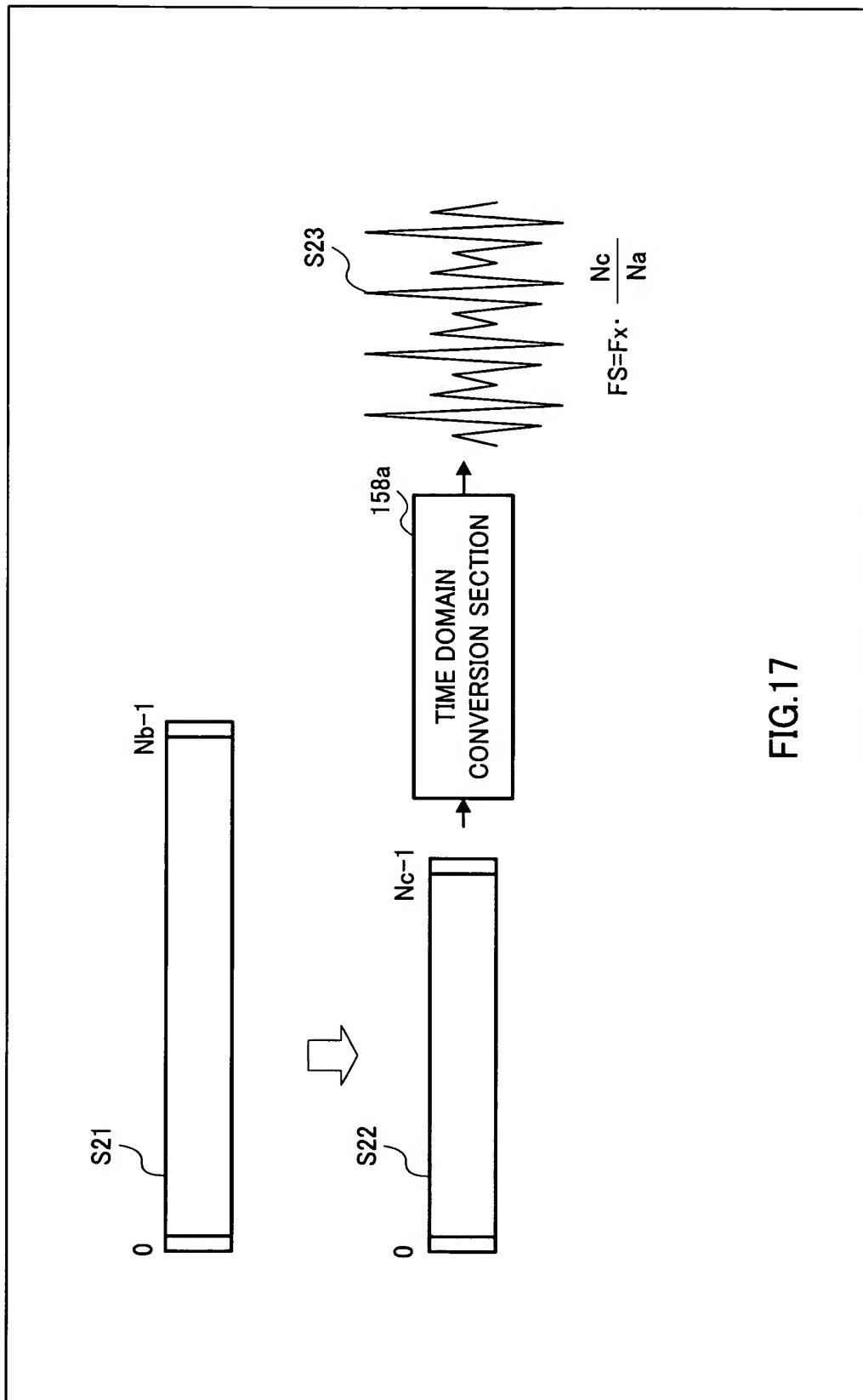


FIG.17

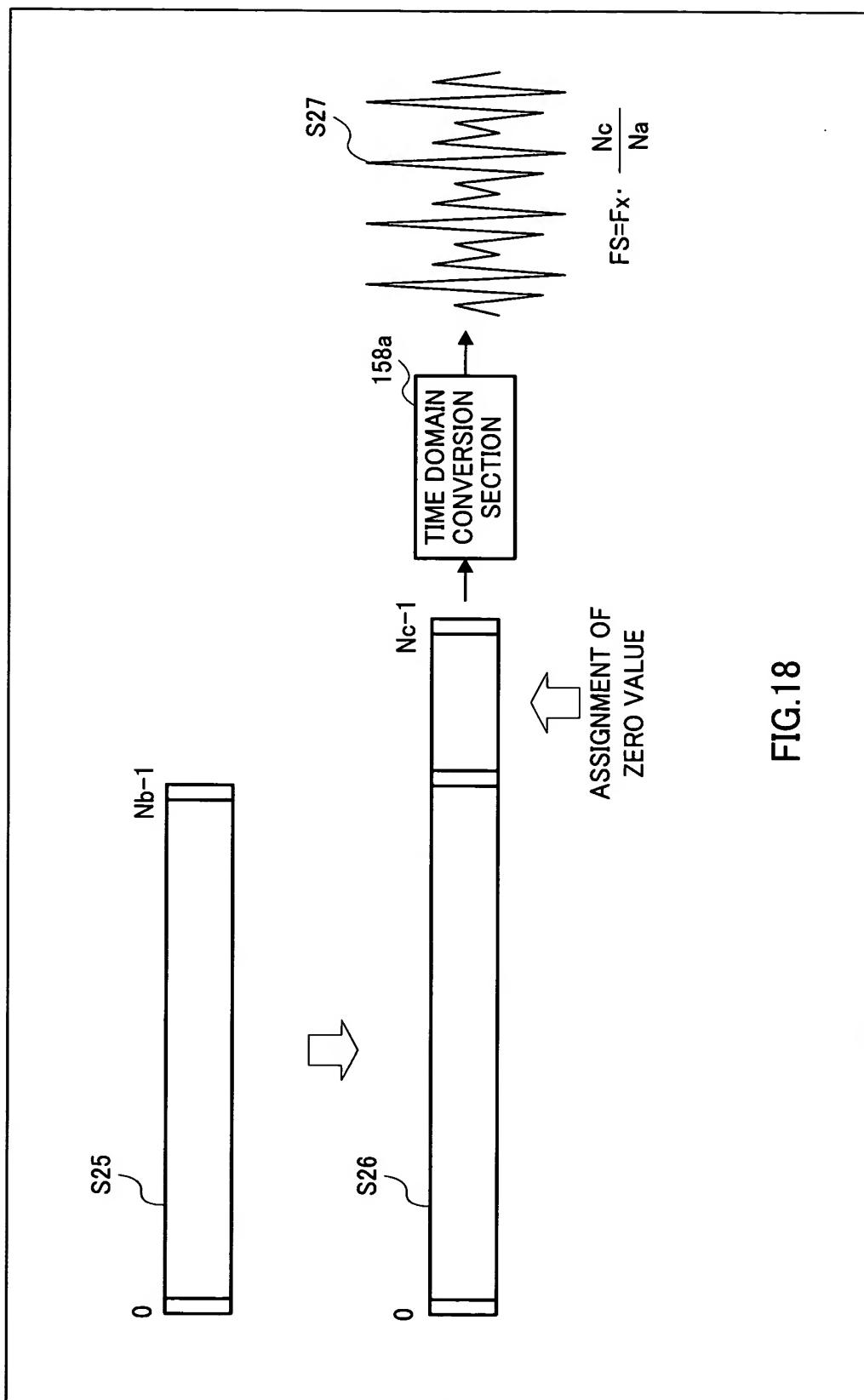


FIG. 18

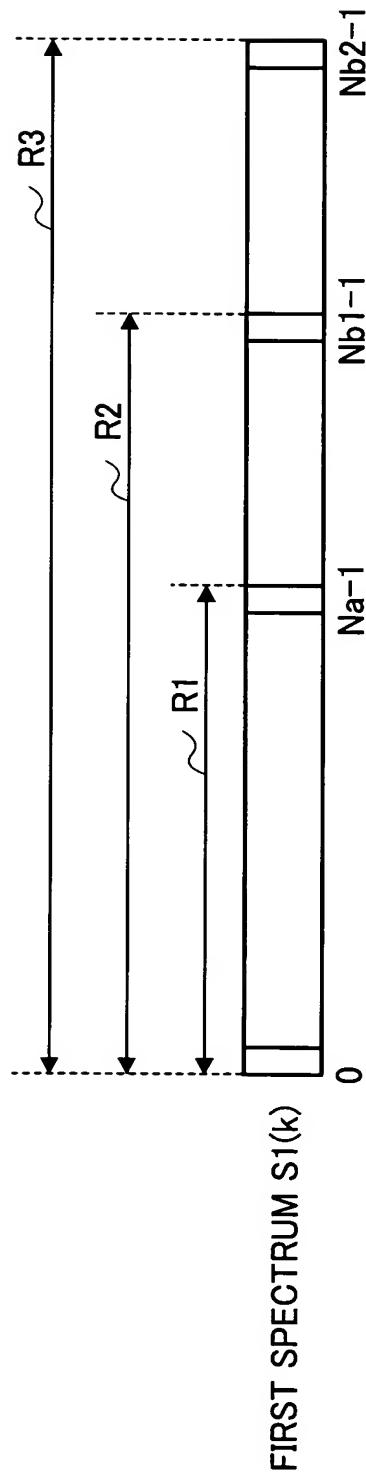


FIG.19

FIG.20A

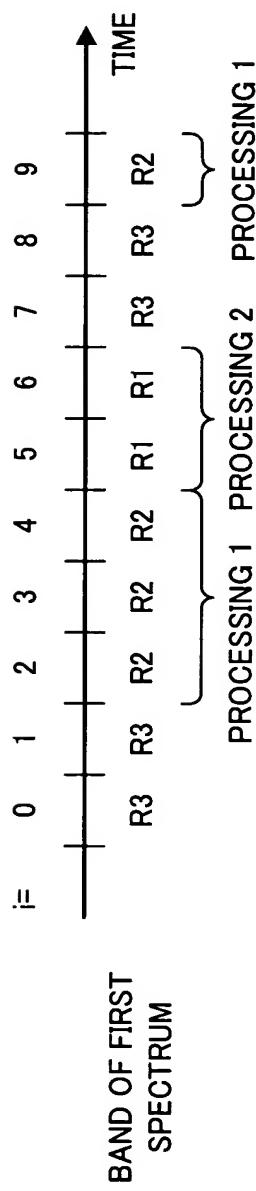
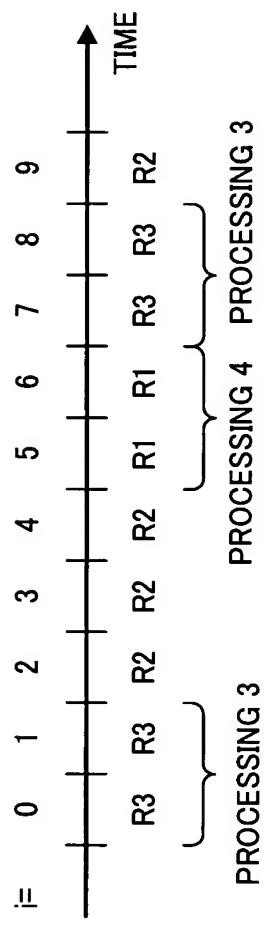


FIG.20B
BAND OF FIRST
SPECTRUM



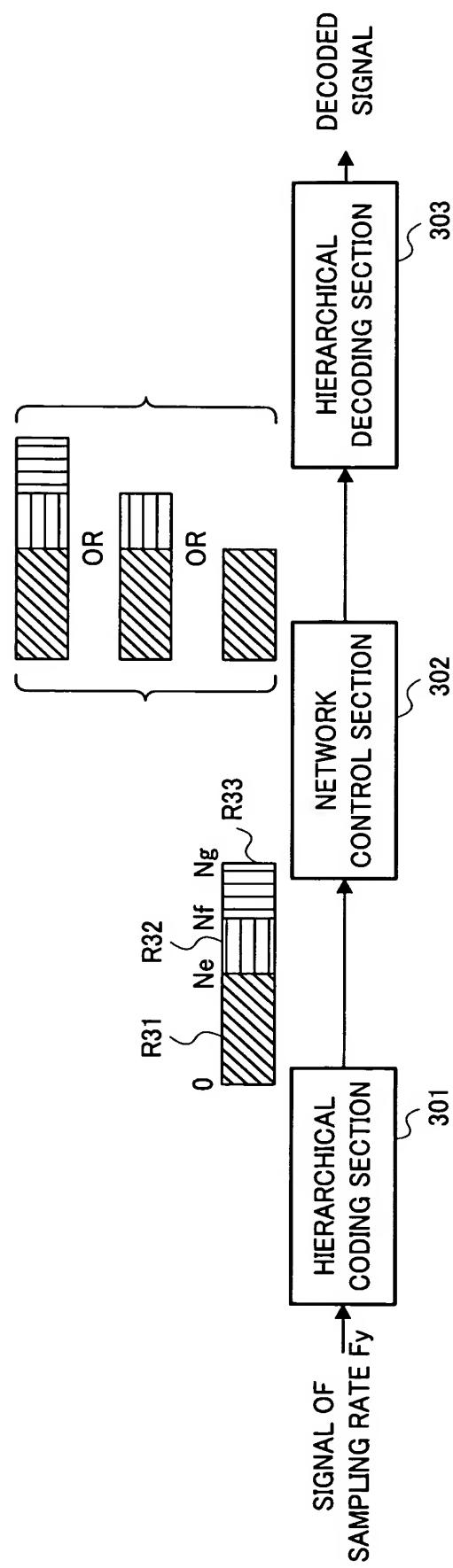


FIG.21

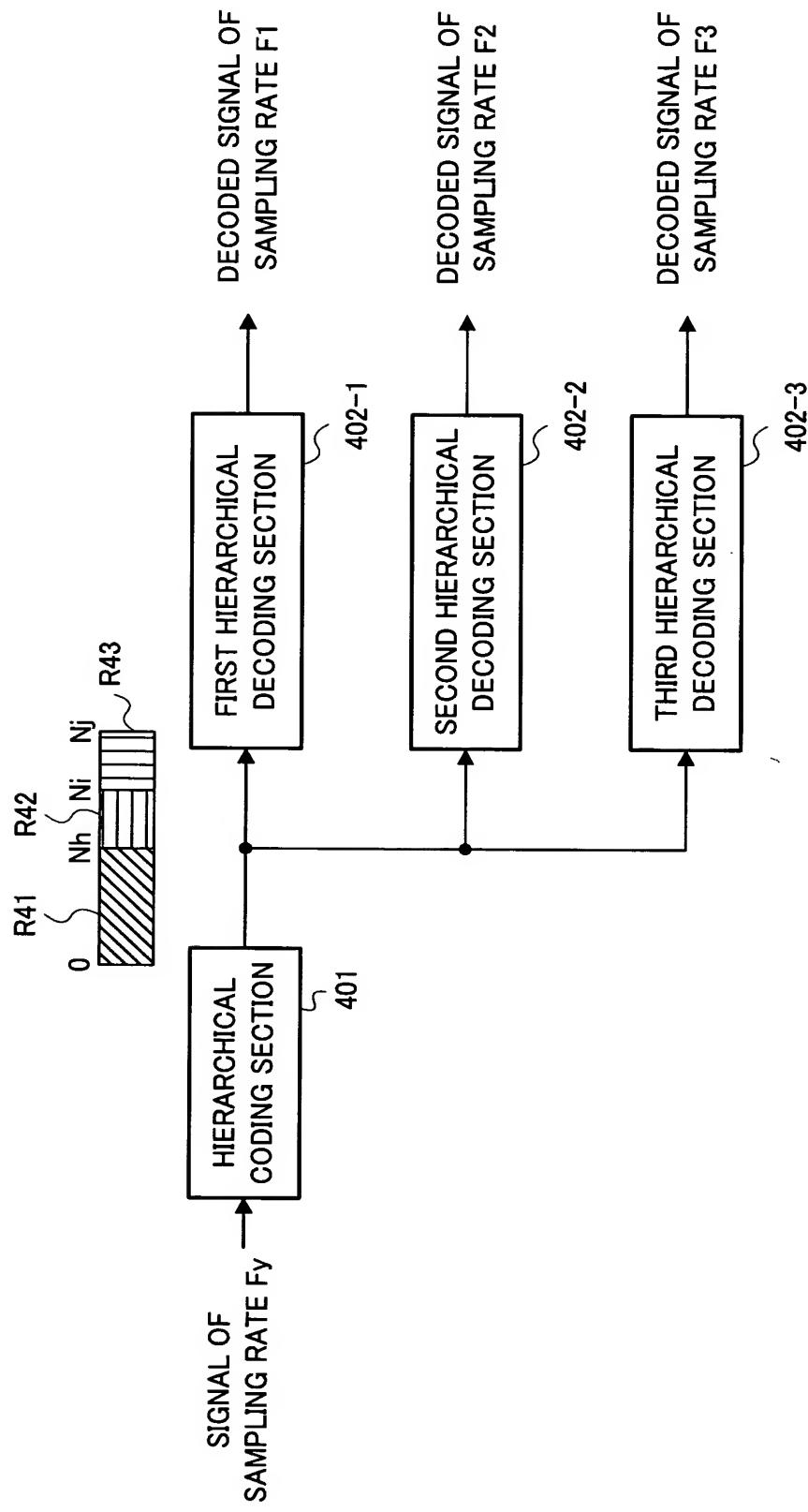


FIG.22